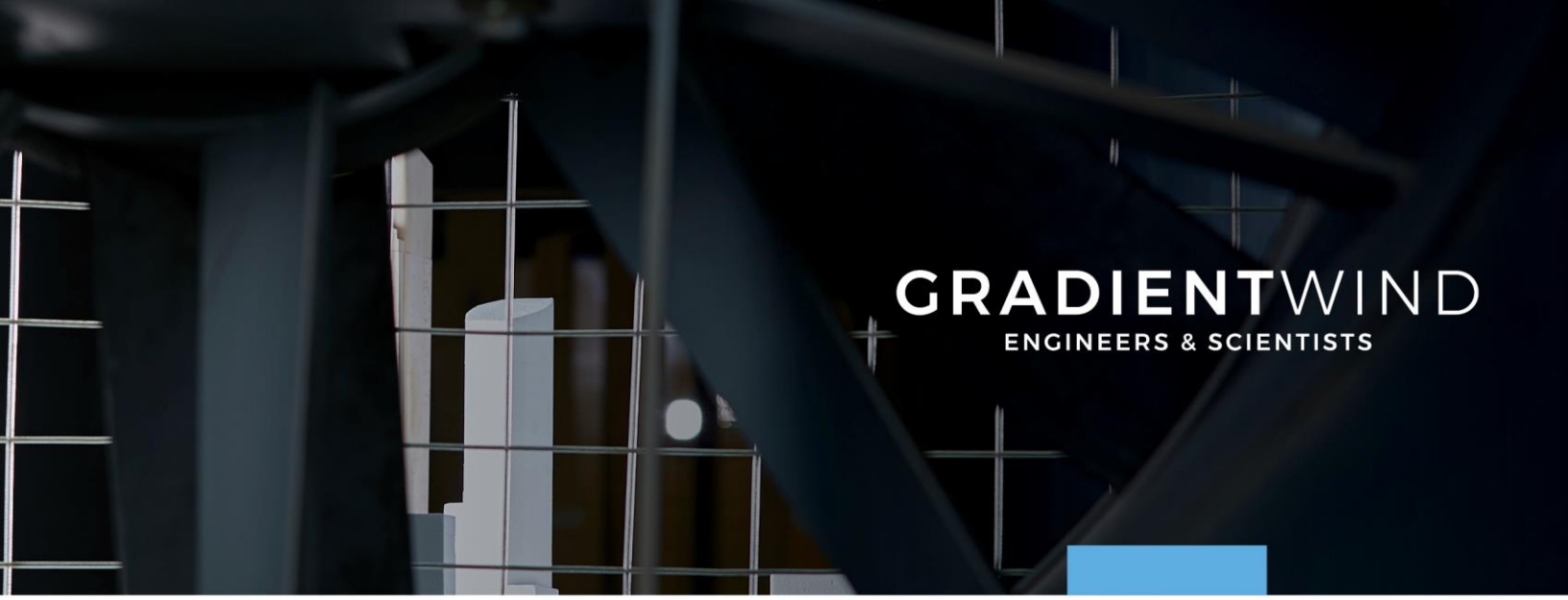

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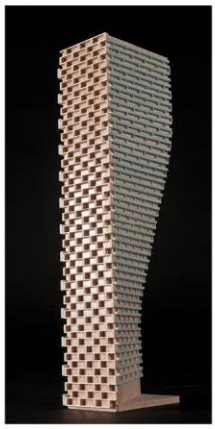
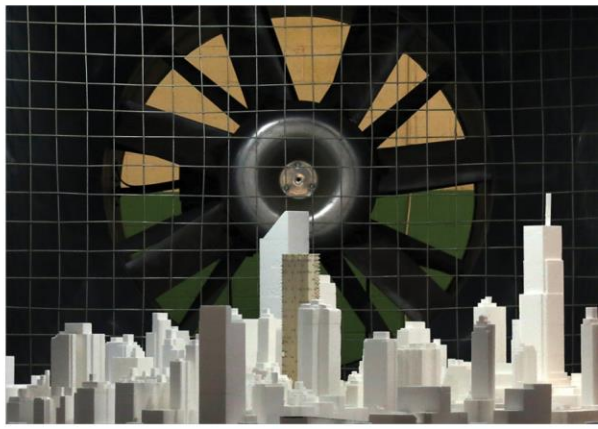
ROADWAY TRAFFIC NOISE ASSESSMENT

2830 Carling Avenue & 810 Vick Avenue
Ottawa, Ontario

Report: 20-251 - Traffic Noise R1





February 4, 2021

PREPARED FOR

1408505 Ontario Inc.
Attn: Mr. Robert A. Wilson
88 David Drive
Ottawa, Ontario K2G 2N5

PREPARED BY

Efser Kara, MSc, LEED GA, Acoustic Scientist
Joshua Foster, P.Eng., Principal

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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EXECUTIVE SUMMARY

This report describes a detailed roadway traffic noise assessment performed for Site Plan Control application (SPA) for the proposed multi-unit residential development located at 2830 Carling Avenue & 810 Vick Avenue in Ottawa, Ontario. The development comprises two rectangular form buildings; one building being 3-storey stacked townhouses (Building A) and the other is a 3-storey triplex (Building B). The major source of roadway traffic noise is Carling Avenue which is running along the north perimeter of the study site. The site is surrounded by low to high-rise residential buildings. Figure 1 illustrates the site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) site plan drawings prepared by Pye & Richards – Temprano & Young Architects Inc., dated November 12, 2020.

The results of the current analysis indicate that noise levels will range between 58 and 72 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 47 and 64 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north façade, which is nearest and most exposed to Carling Avenue.

Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 7. A detailed review of the window and wall assemblies should be performed by a qualified engineer with expertise in acoustics during the detailed design stage of the building when more information on the building assemblies is available.

The results of the calculations also indicate that Building A will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable living environment. Building B should be designed with forced air heating and provisions for the installation of central air conditioning or a similar ventilation system at the occupant's discretion. Warning clauses will also be required in all Lease, Purchase and Sale Agreements, as

summarized in Section 6. The noise levels at the rear yard of Building B (3-storey triplex building) do not exceed the 55 dBA criterion; therefore, no noise mitigation measure is required.

With regard to stationary noise, as the proposed development is a low-rise apartment building, no significant pieces of mechanical equipment are associated with the development. We would anticipate only small-scale residential air conditioning units that are exempt from consideration of stationary noise as per the ENCG and NPC-300.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by 1408505 Ontario Inc. to undertake a roadway traffic noise assessment for the proposed residential development located at 2830 Carling Avenue and 810 Vick Avenue in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

This assessment is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and the Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on site plan drawings prepared by Pye & Richards – Temprano & Young Architects Inc., dated November 12, 2020, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The study site is a multi-unit residential development located at 2830 Carling Avenue and 810 Vick Avenue. The development is going to be built on 1,686 square metres of land bordered by Carling Avenue to the north, Vick Avenue to the east, Judge Street to the west, and low-rise residential buildings to the south.

The development consists of a three-storey stacked townhouse building along Carling Avenue, containing 27 units, referred to as Building A, and a three-storey triplex fronting on Vick Avenue referred to as Building B. The development's underground structure will contain 42 parking spaces, a bicycle storage room, a garbage/recycling room; and a mechanical/electrical room. The development will have a 2-way private approach to the parking garage entrance which will be provided from Judge Street.

The rear yard of Building B was taken as an Outdoor Living Area (OLA) and included in the calculations. The buildings have protruding balconies that are less than 4 metres in depth. As only balconies and terraces with a minimum depth of 4 metres are considered as Outdoor Living Areas (OLA) as per the ENCG, these areas are not considered in the traffic noise calculations.

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016
[2] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

The major source of roadway traffic noise is Carling Avenue which is running along the north perimeter of the site. Figure 1 illustrates the site plan with the surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG) as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure level at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard sound pressure level (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicular traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time-varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time-varying noise level over a period of time. For roadways and LRT, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms and sleeping quarters respectively for roadway, as listed in

Table 1. Based on Gradient Wind's experience, more comfortable indoor noise levels should be targeted, towards 42 and 37, respectively, to control peak noise and deficiencies in building envelope construction.

TABLE 1: INDOOR SOUND LEVEL CRITERIA

Type of Space	Time Period	Leq (dBA)
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45
Sleeping quarters of hotels/motels	23:00 – 07:00	45
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[3]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[4]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[5].

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion.

[3] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[4] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[5] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the Ministry of the Environment, Conservations and Parks' (MECP) computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all roads was taken to be 92% / 8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study site.
- A total of seven (7) receptor locations were chosen around the study site; 6 of them at the facades of the buildings as Plane of Window (POW) receptors and 1 of them is at the outdoors as Outdoor Living Area (OLA) receptor.
- POW receptor heights were taken to be at 8.5 m above grade at the centre of the highest floor windows. The OLA receptor height was taken at 1.5 m above grade.
- The receptor distances to roadway traffic and exposure angles are illustrated in Figures 3-6.

4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[6] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

[6] City of Ottawa Transportation Master Plan, November 2013

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Carling Avenue	4-Lane Urban Arterial-Divided (4-UAD)	60	**35,000**

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels are achieved. The calculation procedure[7] considers:

- Window type and total area as a percentage of total room floor area
- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research[8], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, detailed floor layouts have not been finalized; therefore,

[7] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985
[8] CMHC, Road & Rail Noise: Effects on Housing

detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

5. ROADWAY TRAFFIC NOISE RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	8.5	POW North Façade – Building A	72	64
2	8.5	POW West Façade – Building A	68	61
3	8.5	POW South Façade – Building A	56	47
4	8.5	POW East Façade – Building A	68	60
5	1.5	OLA – Rear yard of Building B	53	N/A*
6	8.5	POW North Façade – Building B	58	51
7	8.5	POW East Façade – Building B	62	54

* OLA noise levels during the nighttime are not considered, as per the ENCG.

The results of the current analysis indicate that noise levels will range between 58 and 72 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 47 and 64 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north, east, and west façades of Building A, which is nearest and most exposed to Carling Avenue. The noise levels at the rear yard of Building B (3-storey triplex building) do not exceed the 55 dBA criterion; therefore, no noise mitigation measure is required.

The results of the calculations also indicate that the north, east, and west facades of Building A will require upgraded building components. Building components compliant with the Ontario Building Code (OBC 2012) will be sufficient for Building B and the south façade of Building A.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows and walls have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). As per the City of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application. The STC requirements for the windows are summarized below for various units within the development (see Figure 7):

- **Bedroom Windows**

(i) Bedroom windows of Building A facing north will require a minimum STC of 35

(ii) Bedroom windows of Building A facing east and west will require a minimum STC of 31

(iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Living Room Windows**

(i) Living room windows of Building A facing north will require a minimum STC of 30

(ii) Living room windows of Building A facing east and west will require a minimum STC of 26

(iii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Exterior Walls**

(i) Exterior wall components on the north, east and west façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[9]

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where punched window and wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems that have a combination of glass thickness and inter-pane

[9] J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

spacing. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

The results of the calculations also indicate that Building A will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable working environment. Building B should be designed with forced air heating and provisions for the installation of central air conditioning or a similar ventilation system. In addition to ventilation requirements, warning clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 58 and 72 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 47 and 64 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north façade, which is nearest and most exposed to Carling Avenue.

Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 7. A detailed review of the window and wall assemblies should be performed by a qualified engineer with expertise in acoustics during the detailed design stage of the building when more information on the building assemblies is available. The noise levels at the rear yard of Building B (3-storey triplex building) do not exceed the 55 dBA criterion; therefore, no noise mitigation measure is required.

The results of the calculations also indicate that Building A will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable living environment. Building B should be designed with forced air heating and provisions for the installation of central air conditioning or a similar ventilation system at the occupant's discretion. Warning clauses will also be required in all Lease, Purchase and Sale Agreements.

For Building A, the warning clause below should be used in all Lease, Purchase and Sale Agreements:

> *"Purchasers/tenants are advised that sound levels due to increasing roadway traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.*
>
> *To help address the need for sound attenuation this development includes:*
> - *Multi-pane glazing with STC 35 for north bedroom windows*
> - *Multi-pane glazing with STC 31 for east and west bedroom windows*
> - *Multi-pane glazing with STC 30 for north living room windows*
> - *Multi-pane glazing with STC 26 for east and west living room windows*
> - *A minimum sound transmission class (STC) rating of 45 for the south, east and west exterior walls*
>
> *To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.*
>
> *This dwelling unit has been supplied with a ventilation/air conditioning system and other measures which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment."*

For Building B, the warning clause below should be used in all Lease, Purchase and Sale Agreements:

> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing roadway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.*
>
> *This dwelling unit has been designed with the provision for adding air conditioning or a similar ventilation system at the occupant's discretion. Installation of air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment."*

With regard to stationary noise, as the proposed development is a low-rise apartment building, no significant pieces of mechanical equipment are associated with the development. We would anticipate only small-scale residential air conditioning units that are exempt from consideration of stationary noise as per the ENCG and NPC-300.

This concludes our traffic noise assessment and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

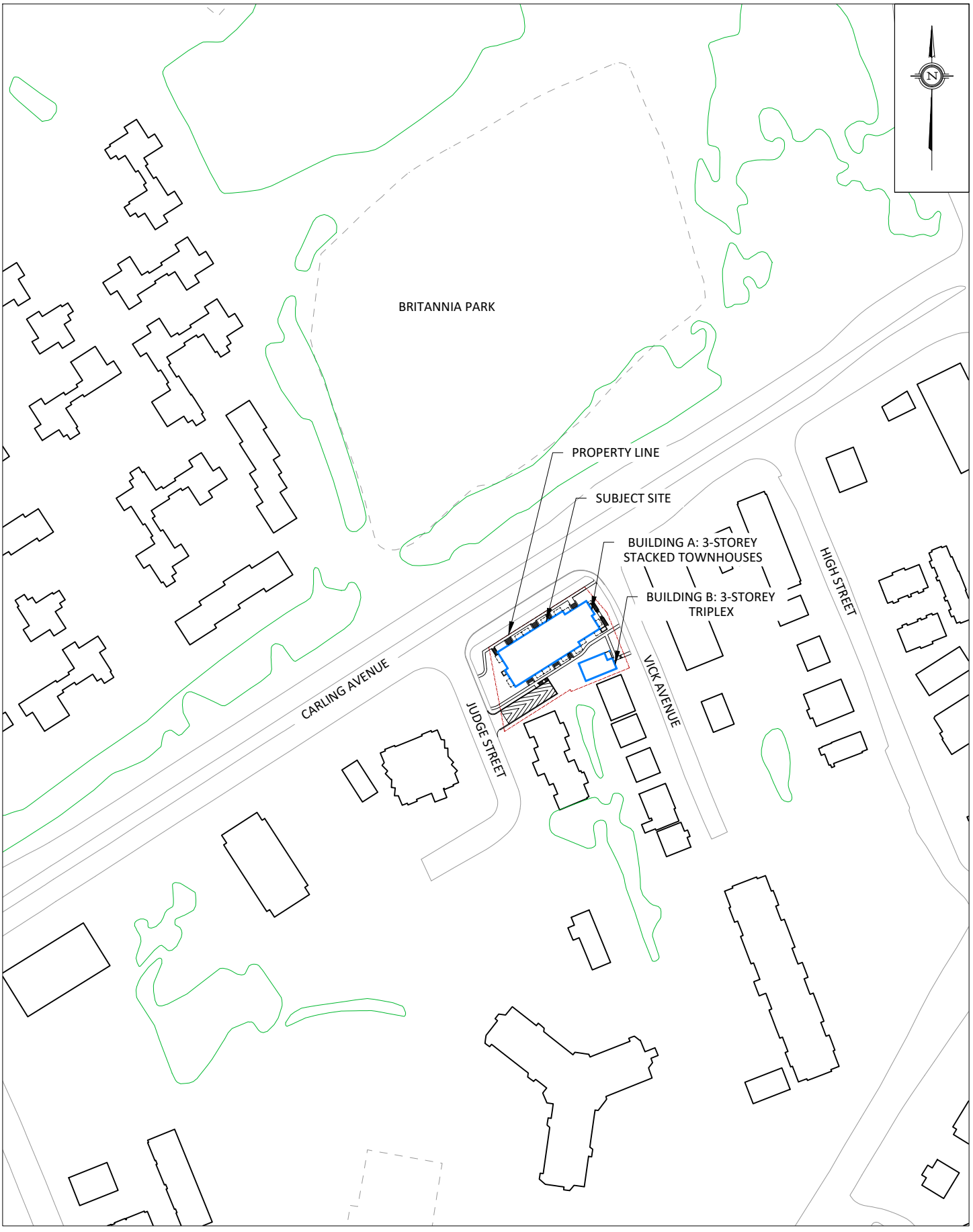
Sincerely,

Gradient Wind Engineering Inc.

Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File: 20-251-Traffic Noise R1



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PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW20-251-1
DATE	FEBRUARY 3, 2021
DRAWN BY	E.K.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT

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SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-251-2
DATE	FEBRUARY 3, 2021	DRAWN BY	E.K.

FIGURE 2:
RECEPTOR LOCATIONS

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PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-251-3
DATE	FEBRUARY 3, 2021	DRAWN BY	E.K.

FIGURE 3:
STAMSON INPUT DATA
FOR RECEPTORS 1, 2, & 4

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PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. GW20-251-4	FIGURE 4: STAMSON INPUT DATA FOR RECEPTORS 3 & 7
DATE	FEBRUARY 3, 2021	DRAWN BY E.K.	

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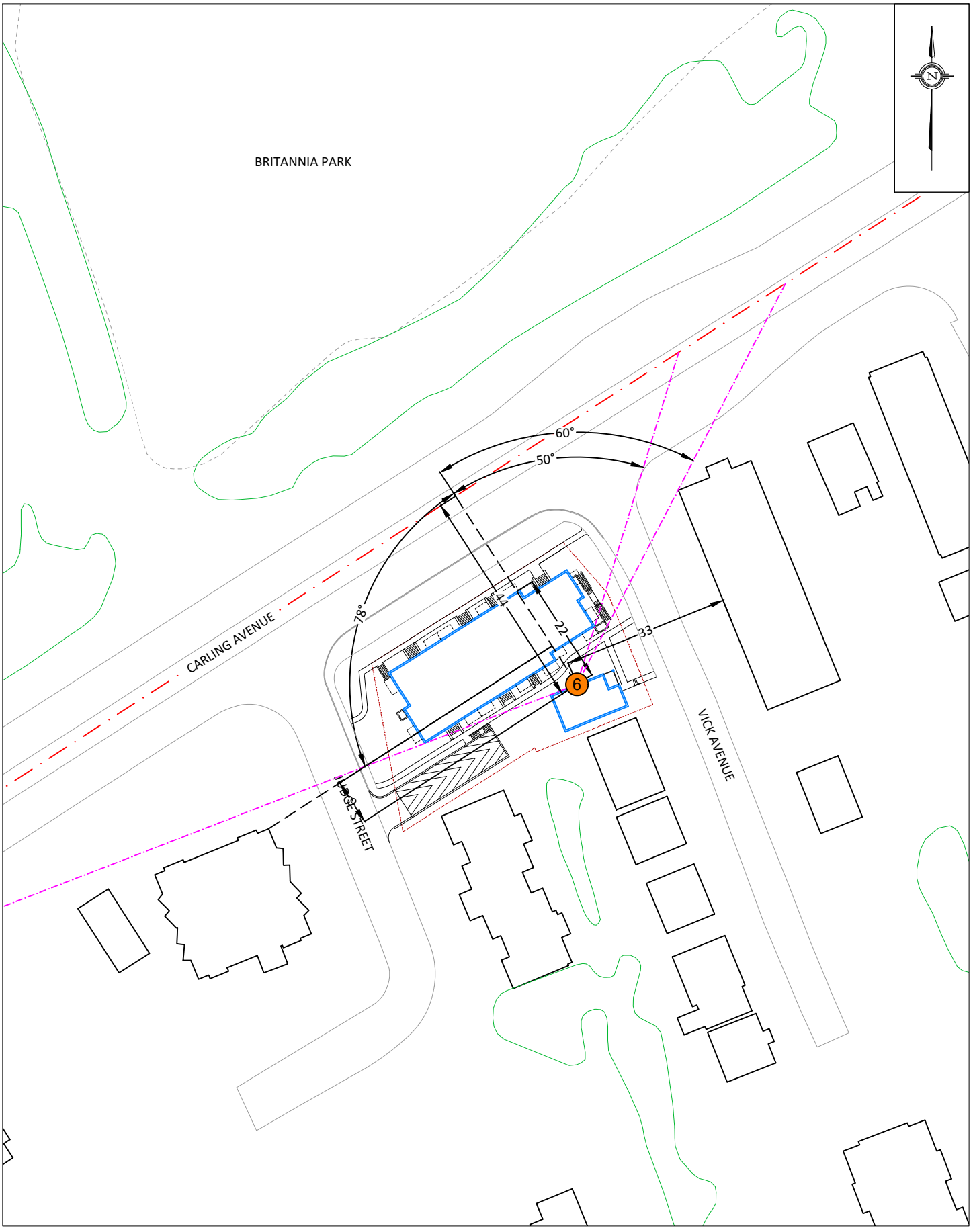
PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-251-5
DATE	FEBRUARY 3, 2021
DRAWN BY	E.K.

DESCRIPTION

FIGURE 5:
STAMSON INPUT DATA
FOR RECEPTOR 5



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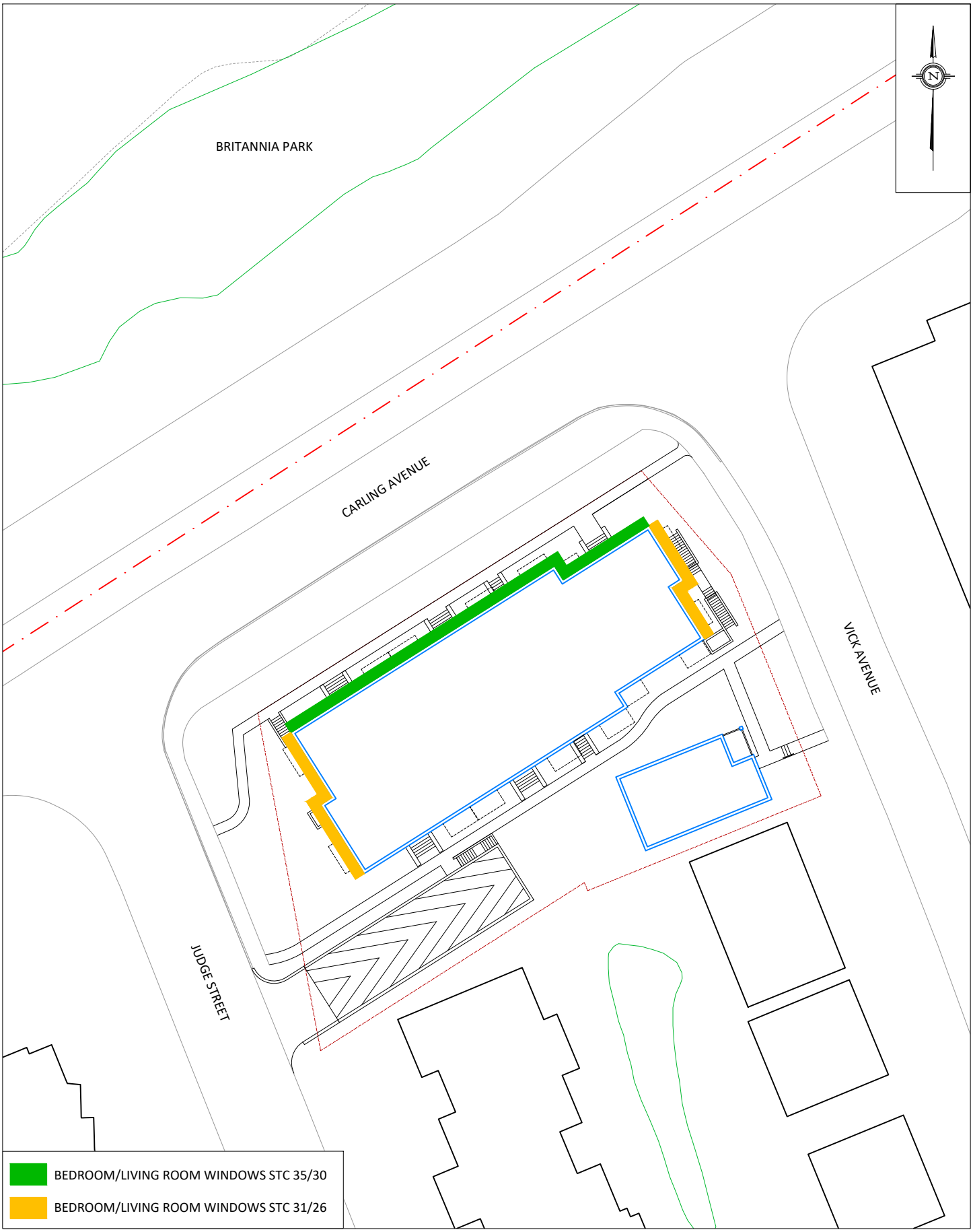
PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-251-6
DATE	FEBRUARY 3, 2021	DRAWN BY	E.K.

FIGURE 6:
STAMSON INPUT DATA
FOR RECEPTOR 6



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PROJECT	2830 CARLING AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:500 (APPROX.)	DRAWING NO.	GW20-251-7
DATE	FEBRUARY 3, 2021	DRAWN BY	E.K.

FIGURE 7:
STC REQUIREMENTS

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:08:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Carling Av (day)

Source height = 1.50 m

ROAD (0.00 + 72.01 + 0.00) = 72.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-1.66	0.00	0.00	0.00	0.00	72.01

Segment Leq : 72.01 dBA

Total Leq All Segments: 72.01 dBA

Results segment # 1: Carling Av (night)

Source height = 1.50 m

ROAD (0.00 + 64.42 + 0.00) = 64.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-1.66	0.00	0.00	0.00	0.00	64.42

Segment Leq : 64.42 dBA

Total Leq All Segments: 64.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.01
(NIGHT): 64.42

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:14:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 26.00 / 26.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Carling Av (day)

Source height = 1.50 m

ROAD (0.00 + 68.28 + 0.00) = 68.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 73.68 0.00 -2.39 -3.01 0.00 0.00 0.00 68.28

Segment Leq : 68.28 dBA

Total Leq All Segments: 68.28 dBA

Results segment # 1: Carling Av (night)

Source height = 1.50 m

ROAD (0.00 + 60.68 + 0.00) = 60.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 66.08 0.00 -2.39 -3.01 0.00 0.00 0.00 60.68

Segment Leq : 60.68 dBA

Total Leq All Segments: 60.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.28
(NIGHT): 60.68

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:15:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 38.00 / 38.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 16.00 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Carling Av (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 5.55 ! 5.55

ROAD (0.00 + 56.00 + 0.00) = 56.00 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 73.68 0.00 -4.04 0.00 0.00 0.00 -13.64 56.00

Segment Leq : 56.00 dBA

Total Leq All Segments: 56.00 dBA

Results segment # 1: Carling Av (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 8.48 ! 8.48

ROAD (0.00 + 46.59 + 0.00) = 46.59 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 66.08 0.00 -4.04 0.00 0.00 0.00 -15.45 46.59

Segment Leq : 46.59 dBA

Total Leq All Segments: 46.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.00
(NIGHT): 46.59

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:19:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av1 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av1 (day/night)

Angle1 Angle2 : 0.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Carling Av2 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Carling Av2 (day/night)

Angle1 Angle2 : 80.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 80.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 26.00 / 26.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Carling Av1 (day)

Source height = 1.50 m

ROAD (0.00 + 67.60 + 0.00) = 67.60 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 80 0.00 73.68 0.00 -2.55 -3.52 0.00 0.00 0.00 67.60

Segment Leq : 67.60 dBA

Results segment # 2: Carling Av2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 1.75 ! 1.75

ROAD (0.00 + 45.68 + 0.00) = 45.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
80 90 0.00 73.68 0.00 -2.55 -12.55 0.00 0.00 -12.89 45.68

Segment Leq : 45.68 dBA

Total Leq All Segments: 67.63 dBA

Results segment # 1: Carling Av1 (night)

Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 80 0.00 66.08 0.00 -2.55 -3.52 0.00 0.00 0.00 60.00

Segment Leq : 60.00 dBA

Results segment # 2: Carling Av2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 1.75 ! 1.75

ROAD (0.00 + 38.08 + 0.00) = 38.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
80 90 0.00 66.08 0.00 -2.55 -12.55 0.00 0.00 -12.89 38.08

Segment Leq : 38.08 dBA

Total Leq All Segments: 60.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.63
(NIGHT): 60.03

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:21:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av1 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av1 (day/night)

Angle1 Angle2 : -90.00 deg -78.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -78.00 deg
Barrier height : 17.00 m
Barrier receiver distance : 11.00 / 11.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Carling Av2 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Carling Av2 (day/night)

Angle1 Angle2 : -78.00 deg -67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Carling Av3 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Carling Av3 (day/night)

Angle1 Angle2 : -67.00 deg 66.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -67.00 deg Angle2 : 66.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: Carling Av4 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Carling Av4 (day/night)

Angle1 Angle2 : 66.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 66.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 18.00 / 18.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Carling Av1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 41.96 + 0.00) = 41.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -78 0.00 73.68 0.00 -4.87 -11.76 0.00 0.00 -15.09 41.96

Segment Leq : 41.96 dBA

Results segment # 2: Carling Av2 (day)

Source height = 1.50 m

ROAD (0.00 + 49.99 + 0.00) = 49.99 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-78 -67 0.66 73.68 0.00 -8.08 -15.60 0.00 0.00 0.00 49.99

Segment Leq : 49.99 dBA

Results segment # 3: Carling Av3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 66 0.00 73.68 0.00 -4.87 -1.31 0.00 0.00 -19.87 47.62

Segment Leq : 47.62 dBA

Results segment # 4: Carling Av4 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 46.79 + 0.00) = 46.79 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
66 90 0.00 73.68 0.00 -4.87 -8.75 0.00 0.00 -13.27 46.79

Segment Leq : 46.79 dBA

Total Leq All Segments: 53.44 dBA

Results segment # 1: Carling Av1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 34.36 + 0.00) = 34.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -78 0.00 66.08 0.00 -4.87 -11.76 0.00 0.00 -15.09 34.36

Segment Leq : 34.36 dBA

Results segment # 2: Carling Av2 (night)

Source height = 1.50 m

ROAD (0.00 + 42.40 + 0.00) = 42.40 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-78 -67 0.66 66.08 0.00 -8.08 -15.60 0.00 0.00 0.00 42.40

Segment Leq : 42.40 dBA

Results segment # 3: Carling Av3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 40.03 + 0.00) = 40.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 66 0.00 66.08 0.00 -4.87 -1.31 0.00 0.00 -19.87 40.03

Segment Leq : 40.03 dBA

Results segment # 4: Carling Av4 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 39.19 + 0.00) = 39.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
66 90 0.00 66.08 0.00 -4.87 -8.75 0.00 0.00 -13.27 39.19

Segment Leq : 39.19 dBA

Total Leq All Segments: 45.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.44
(NIGHT): 45.85

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:22:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av1 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av1 (day/night)

Angle1 Angle2 : -90.00 deg -78.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -78.00 deg
Barrier height : 17.00 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Carling Av2 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Carling Av2 (day/night)

Angle1 Angle2 : -78.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -78.00 deg Angle2 : 50.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 22.00 / 22.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Carling Av3 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Carling Av3 (day/night)

Angle1 Angle2 : 50.00 deg 60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: Carling Av4 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Carling Av4 (day/night)

Angle1 Angle2 : 60.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 60.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 33.00 / 33.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Carling Av1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 7.07 ! 7.07

ROAD (0.00 + 44.08 + 0.00) = 44.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -78 0.00 73.68 0.00 -4.67 -11.76 0.00 0.00 -13.16 44.08

Segment Leq : 44.08 dBA

Results segment # 2: Carling Av2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 5.00 ! 5.00

ROAD (0.00 + 51.15 + 0.00) = 51.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-78 50 0.00 73.68 0.00 -4.67 -1.48 0.00 0.00 -16.37 51.15

Segment Leq : 51.15 dBA

Results segment # 3: Carling Av3 (day)

Source height = 1.50 m

ROAD (0.00 + 56.45 + 0.00) = 56.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
50 60 0.00 73.68 0.00 -4.67 -12.55 0.00 0.00 0.00 56.45

Segment Leq : 56.45 dBA

Results segment # 4: Carling Av4 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 3.25 ! 3.25

ROAD (0.00 + 48.16 + 0.00) = 48.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
60 90 0.00 73.68 0.00 -4.67 -7.78 0.00 0.00 -13.06 48.16

Segment Leq : 48.16 dBA

Total Leq All Segments: 58.21 dBA

Results segment # 1: Carling Av1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 7.07 ! 7.07

ROAD (0.00 + 36.48 + 0.00) = 36.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -78 0.00 66.08 0.00 -4.67 -11.76 0.00 0.00 -13.16 36.48

Segment Leq : 36.48 dBA

Results segment # 2: Carling Av2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 5.00 ! 5.00

ROAD (0.00 + 43.55 + 0.00) = 43.55 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-78 50 0.00 66.08 0.00 -4.67 -1.48 0.00 0.00 -16.37 43.55

Segment Leq : 43.55 dBA

Results segment # 3: Carling Av3 (night)

Source height = 1.50 m

ROAD (0.00 + 48.85 + 0.00) = 48.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
50 60 0.00 66.08 0.00 -4.67 -12.55 0.00 0.00 0.00 48.85

Segment Leq : 48.85 dBA

Results segment # 4: Carling Av4 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 3.25 ! 3.25

ROAD (0.00 + 40.56 + 0.00) = 40.56 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
60 90 0.00 66.08 0.00 -4.67 -7.78 0.00 0.00 -13.06 40.56

Segment Leq : 40.56 dBA

Total Leq All Segments: 50.61 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.21
(NIGHT): 50.61

STAMSON 5.0 NORMAL REPORT Date: 02-02-2021 16:23:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Carling Av1 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Carling Av1 (day/night)

Angle1 Angle2 : 11.00 deg 48.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Carling Av2 (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Carling Av2 (day/night)

Angle1 Angle2 : 48.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height : 8.50 / 8.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 48.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Carling Av1 (day)

Source height = 1.50 m

ROAD (0.00 + 61.49 + 0.00) = 61.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
11 48 0.00 73.68 0.00 -5.31 -6.87 0.00 0.00 0.00 61.49

Segment Leq : 61.49 dBA

Results segment # 2: Carling Av2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 5.07 ! 5.07

ROAD (0.00 + 50.85 + 0.00) = 50.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
48 90 0.00 73.68 0.00 -5.31 -6.32 0.00 0.00 -11.19 50.85

Segment Leq : 50.85 dBA

Total Leq All Segments: 61.85 dBA

Results segment # 1: Carling Av1 (night)

Source height = 1.50 m

ROAD (0.00 + 53.89 + 0.00) = 53.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
11 48 0.00 66.08 0.00 -5.31 -6.87 0.00 0.00 0.00 53.89

Segment Leq : 53.89 dBA

Results segment # 2: Carling Av2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 8.50 ! 5.07 ! 5.07

ROAD (0.00 + 43.26 + 0.00) = 43.26 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
48 90 0.00 66.08 0.00 -5.31 -6.32 0.00 0.00 -11.19 43.26

Segment Leq : 43.26 dBA

Total Leq All Segments: 54.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.85
(NIGHT): 54.25